

that of a customer ~~loyalty card~~ for ~~another type of~~  
business of any kind.

In order to end this situation where each  
chip card has to be limited to one type of application,  
5 new software architectures are being considered. These  
new software architectures are making use of the  
development of standardized programming languages (~~for~~  
~~example the language "JAVA"~~) which resolve the problems  
of portability, such as the programming language JAVA,  
10 for example.

Figure 1 is a simplified view of a software  
architecture of the chip ~~card projects~~cards that are  
now being developed. The architecture shown in Figure  
1 ~~comprises~~includes, in particular, a first part 110  
15 that corresponds to ~~what is called~~ the software  
~~architecture of a chip card 100~~ and a second part 120  
that corresponds to ~~what is called~~ the applications  
part of the software architecture ~~offor~~for the chip card  
100. The system part 110 ~~of the chip card~~ is  
20 essentially formed by a library of programs 112 ~~offor~~for  
~~the chip card operating system of the chip card~~, an  
interface 114 to manage the interactions with, ~~for~~  
~~example, the microprocessor of the chip card or else or~~  
the different memories of the chip card, and a space  
25 for the management of hardware interruptions 116.

The applications part 120 of the software  
architecture ~~consists of~~includes different  
applications:

———, such as a first, second and third main  
30 application, respectively 122, 124 and 126;  
———, and a first, second and third additional  
application, respectively 121, 123 and 125.  
———The main applications 122, 124 and 126 are  
written in a programming language that can be directly  
35 understood by the processor of the chip card.

The additional applications 121, 123 and 125 are typically applications encoded in a standardized language. These applications may be added at any point in time to the system part 110 ~~in an applications part~~  
5 ~~120 of the software architecture described.~~ In Figure 1, the additional applications 121, 123 and 125 depend directly on the first main application 122. The first main application 122 herein serves as an interpreter between the additional applications and the operating  
10 system by converting the codes of the additional applications into a machine language that can be understood by the programs of the operating system 112.

~~\_\_\_\_\_ The device with secured access to applications of a chip card according to the invention comes into play in an architecture of this type.~~  
15

The software architecture that has just been described is more complex than the one currently existing in chip cards in circulation. ~~Indeed, the~~ architecture described assumes that it is possible to  
20 add applications in a standardized programming language, possibly after the chip card is put into circulation. It is therefore more complicated to achieve a satisfactory level of security ~~than was the case~~ compared to when a single application or a group of  
25 applications dedicated to a single chip card function ~~was~~ were the only applications to be loaded ~~once and for all~~ into the chip card ~~which.~~ The chip card was then permanently limited in terms of available applications. The risk that a new application might disturb the  
30 ~~working operation~~ of previous applications was therefore not as great.

The coexistence of applications of different kinds ~~in one and~~ the same chip card may raise a certain number of problems. For example, a software  
35 architecture simultaneously containing an application

dedicated to the assessment of a customer's  
loyaltyaccess to a gasoline company and a standard  
banking application must ensure that a secret key used  
in the banking application cannot be read during the  
5 use of the application associated with the gasoline  
company.

SUMMARY OF THE INVENTION

Summary of the Invention

It is an object of the present invention to  
10 overcome the problems that have just been described.

~~To this end, the invention proposes a~~ device  
enabling is provided that enables the management of  
different software applications that are installed,  
possibly at different times, or the management of  
15 different hardware events, of a chip card while  
providing ~~for~~ high security. Thus, the device  
according to the invention offers the possibility of  
detection when the user of an application tries to  
exceed his rights, for example, by attempting to access  
20 data not intended for the application in question.

To achieve ~~these goals~~ this objective, the  
~~invention proposes to~~ device sets up specific  
instructions internal to the microprocessor of the chip  
card. These specific instructions are call  
25 instructions ~~(DCALL)~~ and return instructions ~~(DRETURN)~~.  
These call and return instructions are associated  
~~according to the invention with specific registers by~~  
~~which it can be ascertained that~~ for determining whether  
the operations performed by the application during  
30 ~~execution in the chip card are authorized or not~~  
authorized.

The invention therefore pertains to a device  
for ~~access to~~ accessing applications of a chip card  
comprising a microprocessor associated with an  
35 operating system working with a set of instructions, a